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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/651,696	08/30/2000	Peter Ledel Gammel	18-47-1-57	2486

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Agere Systems Inc.
Four Connell Drive
Room 4U533C
Berkeley Heights, NJ 07922-0614

EXAMINER	
PATEL, ASHOK	

ART UNIT	PAPER NUMBER
2879	

DATE MAILED: 04/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/651,696	GAMMEL ET AL.	
	Examiner	Art Unit	
	Ashok Patel	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *8-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *8-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *0800,1100,0202*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. The Examiner does not consider some of the prior art publications (AT thru AZ) cited in PTOL-1449, filed on 08/30/2000 (a copy enclosed herewith), since the PTOL does not provide full title of these prior art publications. Also the same PTOL-1449 lists co-pending U.S. Patent applications (BC thru BH). Since co-pending U.S. Patent applications are not considered as prior art references, the Examiner crosses out all of the co-pending U.S. Patent applications.

2. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:
(1) if a machine or apparatus, its organization and operation;
(2) if an article, its method of making;

(3) if a chemical compound, its identity and use;
(4) if a mixture, its ingredients;
(5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

The abstract does not reflect the subject matter of the claimed invention. The abstract rather reflects a method of making the device, which has been restricted in the past.

3. Applicant's arguments filed 11/28/2003 have been fully considered but they are not persuasive with respect to claims 8-11.

4. Claims 19-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Since parent claim 8 includes a (single) device, dependent claim 19 can not recite the same including plurality of devices. Since claim 19 appears to be a combination type claim and claim 8 appears to be sub-combination type claim, claim 19 appears to be broader than that of claim 8. Claim 19 is apparently directed to a plurality of vacuum microelectromechanical devices. The Examiner proposes to amend the preamble of claim 19 to be independent and to read as: "A plurality of vacuum microelectromechanical devices,

each of the plurality of vacuum microelectromechanical devices comprising:.....".

Claim 20 is necessarily rejected since it depends upon claim 19.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 8-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Zhang et al (USPN 5,536,988).

Zhang et al disclose applicant's claimed device (Figs. 1-2) including a vacuum micro-electromechanical device that includes: a device substrate (12), a cathode (22) attached to the substrate having emitters, a grid (282) attached to the device substrate, an output structure with the cathode surface and the grid surface substantially parallel and the cathode or grid attached to the device substrate by one or ore flexural members (col. 5, lines 54-67).

The Examiner does not give a patentable weight to the newly added functional limitation since it is narrative in form. In

order to be given patentable weight, the newly added functional recitation must be expresses a "means" for performing the specified function, as set forth in 35 U.S.C. 6th paragraph, and must be supported by recitation in the claim of sufficient structure to warrant the presence of the functional language. In re fuller, 1929 C.D. 172: 388 O.G. 279.

As to claim 9, Zhang et al disclose (col. 5, lines 54-67) one or more flexural members attached to the device substrate y one or more flexural members.

As to claim 10, Zhang et al disclose (Figure 8) the cathode and grid surfaces are substantially perpendicular to the device substrate surface.

As to claim 11, Zhang et al disclose (Figs. 1, 5) the cathode and grid surfaces are substantially perpendicular position by locking mechanisms attached to the device substrate by one or more flexural members.

Consequently, Zhang et al anticipate applicant's claims 8-11.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the

differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 12-14 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al in view of Komatsu (USP 5,386,172).

Although, Zhang et al do not disclose the device including anode as claimed by applicant, providing additional electrode, such anode (also known as electron collector electroe) within the vacuum microelectronics device is well known to those skilled in the art for using the device as tetrode. Also modifying the device to include additional electrodes between cathode and anode is also known in the art to use as pentode.

Komatsu, in the same field of endeavor, is cited for showing the vacuum microelectronics device including the additional electrode(s) (Figs. 7, 13, 14, 16, 18, 21 etc.) for the stated purpose.

Consequently, it would have been obvious to one or ordinary skill in the art to modify Zhang et al's device to use as tetrode, pentode tec.

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al in view of Bower et al (USPN 6,630,772).

As to claim 15, although Zhang et al do not disclose the emitter including nanotubes, the use of carbon nanotubes is known in the art for emitting electrons. Bower et al is cited for showing the use of carbon nanotubes as emitter within the vacuum microelectronic device.

Consequently, it would have been obvious to one or ordinary skill in the art to modify Zhang et al's device to include carbon nanotubes as cathode for emitting electrons.

10. Claims 16, 17 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al.

Although Zhang et al do not disclose a specific dimensional limitation as recited in applicant's claims 16 and 17, applicant's such claimed dimensions would have been obvious to one of ordinary skill in the art since it has been held that where general conditions of the claim are discovered in the

prior art, discovering the optimum or workable range involves only routine skill in the art. In re Aller, 105 USPQ 233.

As to claims 19-20, although Zhang et al do not exemplify a plurality of above-mentioned vacuum micro-electronics devices, it is known in the art to provide such plural vacuum micro-electronics devices by cascading repeating structures.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Lee et al and Lambe each are cited for showing a general structure of a vacuum microelectronics device in which all electrodes are provided on the substrate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ashok Patel whose telephone number is 571-272-2456. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4900.

Ashok Patel
Primary Examiner
Art Unit 2879